REMOTE SAMPLING MODULE
FOR USE WITH SPECTRUM TWO N FT-NIR

User's Guide

PerkinElmer®

Release History

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Introduction

About the Remote Sampling System

Near-Infrared (NIR) fiber optic systems offer the potential to take the measurement directly to the sample and can provide real sampling advantages in situations where it is impractical or inconvenient to take sample aliquots and transfer to the lab for analysis. For example, in raw materials testing of powder materials in the warehouse, it is possible to collect the spectrum from the test sample by measuring directly through the sample bag in its container, or through the sample vial container to avoid cross-contamination risk between samples. In reflection, spectra may also be collected by placing the fiber probe tip either directly onto the sample, or slightly above at a fixed distance.

PerkinElmer provides a range of remote sampling systems based on NIR fiber probe coupling to the Spectrum Two N™ FT-NIR spectrometer. Various options are available: performance-optimized versions for either solids or liquids measurements, or an interchangeable version for higher flexibility. These systems are modular in design, featuring a high-performance plug-in fiber interface, with dedicated high sensitivity detector and universal fiber connectors, allowing the system to be coupled with PerkinElmer probes for optimum performance or even with third-party custom probes for specialized applications.

NIR probes are used in a variety of applications: for example, in reaction monitoring, the sample may be immersed in the sample and the changes in spectra monitored over time. A very common application is simple, rapid ID checking of materials, where the probe may incorporate electronic control of instrument and display information at the probe itself so operators can control the measurement and analysis from the probe handle.

About this User's Guide

The Remote Sampling Module consists of a Fiber Optic Probe and a Sample Area Interface for use with the Spectrum Two N FT-NIR spectrometer. The accessory allows reflectance spectra of materials such as bulk powders to be collected remotely from the spectrometer.

This guide is divided into the following chapters:

Introduction

This chapter describes the conventions and warnings used in this guide.

Safety Practices

This chapter provides important general safety information.

Installation

This chapter describes fitting the accessory hardware, and installing the accessory in the software application.

Using the Accessory

This chapter describes the accessory and its use with Spectrum software (version 10.6 or later) or an AssureID version 4 method, including Instrument Validation and AVI Calibration.

Maintenance

This chapter contains routine maintenance procedures, including:

- cleaning the probe tip/cable,
- cleaning the Spectralon sample, and replacing the sponge,
- cleaning the fiber optic probe body and cable,
- a generic cleaning procedure for optical connectors.

Conventions Used in this User's Guide

Normal text is used to provide information and instructions.

Bold text refers to text that is displayed on the screen.

UPPERCASE text, for example ENTER or ALT, refers to keys on the PC keyboard. '+' is used to show that you have to press two keys at the same time, for example, ALT+F.

All eight digit numbers are PerkinElmer part numbers unless stated otherwise.

Notes, Cautions and Warnings

Three terms, in the following standard formats, are also used to highlight special circumstances and warnings.

NOTE: A note indicates additional, significant information that is provided with some procedures.

CAUTION	*We use the term CAUTION to inform you about situations that could result in **serious damage to the instrument** or other equipment. Details about these circumstances are in a box like this one.*
D	*Caution (Achtung)* *Bedeutet, daß die genannte Anleitung genau befolgt werden muß, um einen **Geräteschaden** zu vermeiden.*
DK	*Caution (Bemærk)* *Dette betyder, at den nævnte vejledning skal overholdes nøje for at undgå en **beskadigelse af apparatet**.*
E	*Caution (Advertencia)* *Utilizamos el término **CAUTION** (ADVERTENCIA) para advertir sobre situaciones que pueden provocar **averías graves en este equipo** o en otros. En los recuadros como éste se proporciona información sobre este tipo de circunstancias.*
F	*Caution (Attention)* *Nous utilisons le terme **CAUTION** (ATTENTION) pour signaler les situations susceptibles de provoquer de **graves détériorations de l'instrument** ou d'autre matériel. Les détails sur ces circonstances figurent dans un encadré semblable à celui-ci.*
I	*Caution (Attenzione)* *Con il termine **CAUTION** (ATTENZIONE) vengono segnalate situazioni che potrebbero arrecare **gravi danni allo strumento** o ad altra apparecchiatura. Troverete informazioni su tali circostanze in un riquadro come questo.*
NL	*Caution (Opgelet)* *Betekent dat de genoemde handleiding nauwkeurig moet worden opgevolgd, om **beschadiging van het instrument** te voorkomen.*
P	*Caution (Atenção)* *Significa que a instrução referida tem de ser respeitada para evitar a **danificação do aparelho**.*

WARNING

*We use the term WARNING to inform you about situations that could result in **personal injury** to yourself or other persons. Details about these circumstances are in a box like this one.*

D

Warning (Warnung)

*Bedeutet, daß es bei Nichtbeachten der genannten Anweisung zu einer **Verletzung** des Benutzers kommen kann.*

DK

Warning (Advarsel)

*Betyder, at brugeren kan blive **kvæstet**, hvis anvisningen ikke overholdes.*

E

Warning (Peligro)

*Utilizamos el término **WARNING** (PELIGRO) para informarle sobre situaciones que pueden provocar **daños personales** a usted o a otras personas. En los recuadros como éste se proporciona información sobre este tipo de circunstancias.*

F

Warning (Danger)

*Nous utilisons la formule **WARNING** (DANGER) pour avertir des situations pouvant occasionner des **dommages corporels** à l'utilisateur ou à d'autres personnes. Les détails sur ces circonstances sont données dans un encadré semblable à celui-ci.*

I

Warning (Pericolo)

*Con il termine **WARNING** (PERICOLO) vengono segnalate situazioni che potrebbero provocare **incidenti alle persone**. Troverete informazioni su tali circostanze in un riquadro come questo.*

NL

Warning (Waarschuwing)

*Betekent dat, wanneer de genoemde aanwijzing niet in acht wordt genomen, dit kan leiden tot **verwondingen** van de gebruiker.*

P

Warning (Aviso)

*Significa que a não observância da instrução referida poderá causar um **ferimento** ao usuário.*

Safety Practices

Overview

This chapter describes the general safety practices and precautions that must be observed when operating the Remote Sampling Module. The *Remote Sampling Module* (RSM) is intended for use with PerkinElmer Spectrum Two N FT-NIR spectrometers.

These instruments have been designed and tested in accordance with PerkinElmer specifications, and in accordance with the safety requirements of the International Electrotechnical Commission (IEC). The Accessory conforms to IEC 61010-1 ("Safety Requirements for electrical equipment for measurement, control and laboratory use") as it applies to IEC Class 1 (earthed) appliances and therefore meets the requirements of EC low voltage directive 2006/95/EC.

This advice is intended to supplement, not supersede, the normal safety codes in the user's country. The information provided does not cover every safety procedure that should be practiced. Ultimately, maintenance of a safe laboratory environment is the responsibility of the analyst and the analyst's organization.

Please consult all manuals and CDs supplied with the Remote Sampling Module, and your spectrometer, before you start working. Carefully read the safety information in this chapter and in the other manuals supplied. When setting up the spectrometer and accessory, or performing analyses or maintenance procedures, strictly follow the instructions provided.

Figure 1 Remote Sampling Module fitted to a Spectrum Two N FT-NIR System

Precautions

WARNING

AVERTISSEMENT

Be sure that all operators read and understand the precautions listed below. It is advisable to post a copy of the precautions near the instrument.

Assurez-vous que tous les opérateurs lisent et comprennent les précautions indiquées ci-dessous. Il est conseillé de poster une copie des précautions près de l'instrument.

This probe is not ATEX certified for use in a potentially explosive atmosphere.

Generally:

- Never stare directly into the light projected from the probe, or point this light at another person.
- Do not use the accessory if the spectrometer or accessory shows visible damage.
- If repair or servicing is needed, call your PerkinElmer Service Representative for advice.

Radiation Emitted by the Instrument NIR Source

The NIR source in the PerkinElmer Spectrum Two N FT-NIR spectrometer uses a tungsten halogen bulb that emits ultraviolet, visible and infrared radiation. The majority of this energy is in the infrared region. Do not stare into the beam produced by this bulb.

Measurements of the infrared radiation emitted from the spectrometer's sample window show that exposure limits recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) will not be exceeded during normal operation.

WARNING

AVERTISSEMENT

Do not look directly into the beam emitted from the sample window. Prolonged exposure (>10 seconds) may cause permanent eye damage.

Ne regardez pas directement le faisceau émis dans la fenêtre d'échantillonnage. Une exposition prolongée (> 10 secondes) peut causer des lésions oculaires permanentes.

For further safety and warning information, refer to the appropriate User's Guide for your instrument. These are distributed, as .pdf files, on the **Spectrum Two Manuals CD** (L1050242).

General Operating Conditions

The Remote Sampling Module has been designed and tested in accordance with PerkinElmer specifications and in accordance with the safety requirements of the International Electrotechnical Commission (IEC). The Remote Sampling Module conforms to IEC61010-1 (Safety Requirements for electrical equipment for measurement, control and laboratory use) as part of a Spectrum Two N FT-NIR spectrometer system and therefore meets the requirements of EC directive 2006/95/EC.

Only use the Remote Sampling Module indoors and under the following conditions:

Temperature: 15 °C to 35 °C

Relative Humidity: 80% maximum (non-condensing)

Do not use the Remote Sampling Module if it:

- Shows visible damage;
- Has been subjected to prolonged storage in unfavorable conditions;
- Has been subjected to severe transport stresses.

If possible, avoid any adjustment, maintenance and repair of the opened, operating spectrometer. If any adjustment, maintenance and repair of the opened spectrometer is necessary, this must be done by a skilled person who is aware of the hazard involved.

Electromagnetic Compatibility (EMC) Compliance

Europe

All information concerning EMC standards is in the Declaration of Conformity, and these standards may change as the European Union adds new requirements.

PerkinElmer instruments have been designed and manufactured, having regard to the state of the art, to ensure that:

- the electromagnetic disturbance generated does not exceed the level above which radio and telecommunications equipment or other equipment cannot operate as intended;
- it has a level of immunity to the electromagnetic disturbance to be expected in its intended use which allows it to operate without unacceptable degradation of its intended use.

South Korea

This device complies with MSIP (Ministry 0f Science, ICT, and Future Planning) EMC Registration requirements. This instrument is registered as a Class A instrument for buiness use only. Product seller and user should notice that this equipment is not for house hold use.

A급 기기 (업무용 방송통신기자재)
이 기기는 업무용(A급) 전자파적합기기로서 판
매자 또는 사용자는 이 점을 주의하시기 바라
며, 가정외의 지역에서 사용하는 것을 목적으
로 합니다.

United States (FCC)

United States (FCC) This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a business/industrial/commercial environment is likely to cause harmful interference in which the user will be required to correct the interference at your own expense. Changes or modifications not expressly approved by the manufacturer could void your authority to operate the equipment in compliance with FCC rules.

Note: *Changes or modifications not expressly approved by PerkinElmer could cause the instrument to violate FCC (U.S. Federal Communications Commission) emission regulations, and because of this violation could void the user's authority to operate this equipment.*

Installation

Planning the Installation

After delivery, your PerkinElmer Service Representative will unpack the accessory, fit the holster to the bench (if required), fit the Sample Area Interface in the spectrometer sample area, connect the probe, install the accessory in your software application and ensure the accessory functions correctly.

All other aspects of the installation, particularly those applying to using the probe in a potentially hazardous area, are your responsibility. The information provided in this section is not exhaustive and is for guidance only.

General

- Approximately 100mm to 200mm (4 to 8 inches) of additional bench space to the right of the spectrometer is needed to fit the probe holster.
- To allow the probe cable to hang correctly, the front of the spectrometer must be within approximately 50mm (2 inches) of the edge of the bench.
- The interface connector clamp projects from the edge of the bench; it is protected by a cushioning flexible molding.
- Make sure that the probe cable does not obstruct a drawer or cupboard under the bench, and that the cable is not a tripping hazard.
- Installing the included C-clamp is recommended to ensure handling of the probe does not accidently pull the system off the bench/cart.

Unpacking

The **Sample Area Interface** is packed separately.

The **probe and cable** are packed in a foam-filled re-usable plastic storage case, together with the fittings and keys required.

You may have one of the following probes:

Part Number	Description
L1390052	Solids Reflectance Probe Triggered 2M *Note: Most common probe configuration*
L1390053	Solids Reflectance Probe Triggered 3M *Note: Longer nose section, common configuration for GSK*
L1390055	Solids Reflectance Probe Triggered 5M
L1181316	High Performance Liquids Probe 1mm Pathlength
L1181314	High Performance Liquids Probe 10mm Pathlength
L1250071	Interchangeable Solids/Liquids Probe (Non-Triggered)

NOTE: The probe holder is optional and not part of the shipping kit.

Shipping Kit List

Description	Notes	Part Number
Sample Area Interface		L1390041
Thumbscrew	To secure the Sample Area Interface to the Spectrum Two N	09210950
Fiber Optic Cable Clamp	To secure the probe cable to the bench.	L1390201
3.0mm Wrench		09907928
Cap Screw		09919012
Triggered Fiber Optic Probe and Cable The part shipped depends on the length of cable purchased.	Cable length = 2 m Cable length = 3 m Cable length = 5 m	L1390052 L1390053 L1390055

NOTE: Your shipping list will vary from the above list depending on the configuration purchased.

Optional Probe Stands/Holsters

The following probe holders are available from PerkinElmer and include a bench clamp:

Part Number	Description
L1390221	Stand - Solids Reflectance Probe Triggered (Short) *For use with 2M and 5M triggered probes*
L1390222	Stand - Solids Reflectance Probe Triggered (Long) *For use only with 3M triggered probe*
L1390223	Stand - Solids/Liquids Probe *For use with probe L1250071*
L1390224	Stand - High Performance Liquids Probe 1mm and 10mm Pathlength *For use with probes L1181316 and L1181314*

Installing the Sample Area Interface

The Sample Area Interface can be simply installed into the sample compartment of the spectrometer, after first removing any other sampling accessory fitted.

To remove the current accessory and install the Sample Area Interface:

1. Raise the sample cover to the vertical position and lift the cover upwards, clear of the spectrometer.

   Store sample cover in a safe place for future use.

2. Pull the baseplate of the current sample accessory towards you, and slide the accessory out of the sample area (see Figure 2).

   Store the accessory in a safe place for future use.

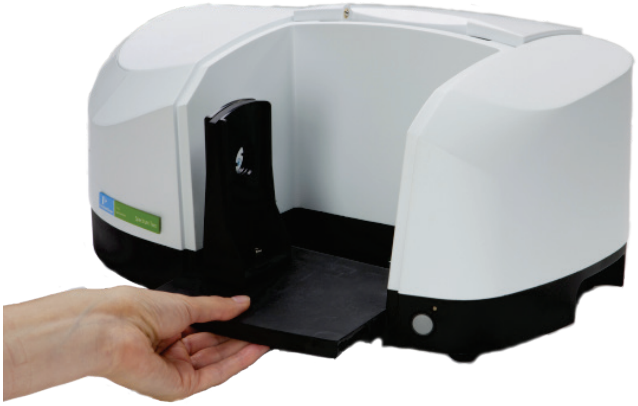


Figure 2 Removing the standard baseplate

3. Plug in the power supply to the connector on the bottom of the Sample Area Interface.

4. Route the cable under the first strain relief then snap it into the white strain relief then position it out the front of the module.

   Ensure the power supply is connected to power and ensure power cord is safely routed to prevent accidental pulling.

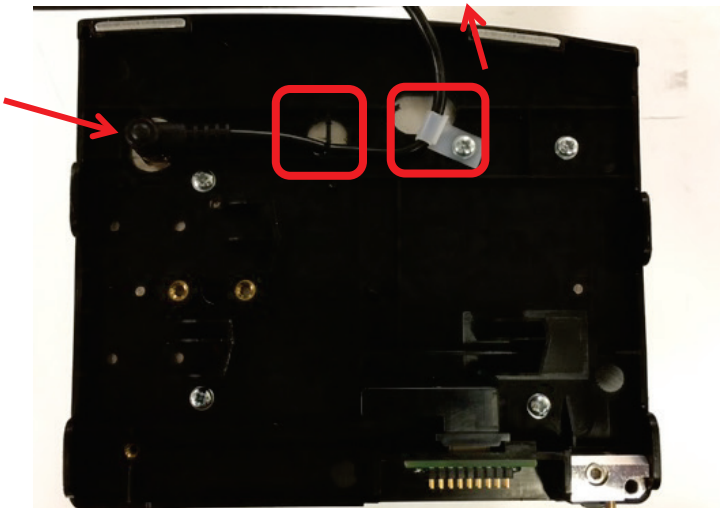


Figure 3 The power cable connected bottom of the module

5. Position the Sample Area Interface in front of the Spectrum Two N sample area, rest the back of it on the ledge in the sample area, and slide it into position.
6. Push it firmly home to ensure that the multi-way connector on the rear of the accessory engages properly with the spectrometer connector.
7. Use the supplied thumbscrew (09210950) to secure the Sample Area Interface to the Spectrum Two N.

   This ensures that the Sample Area Interface is level and cannot move.

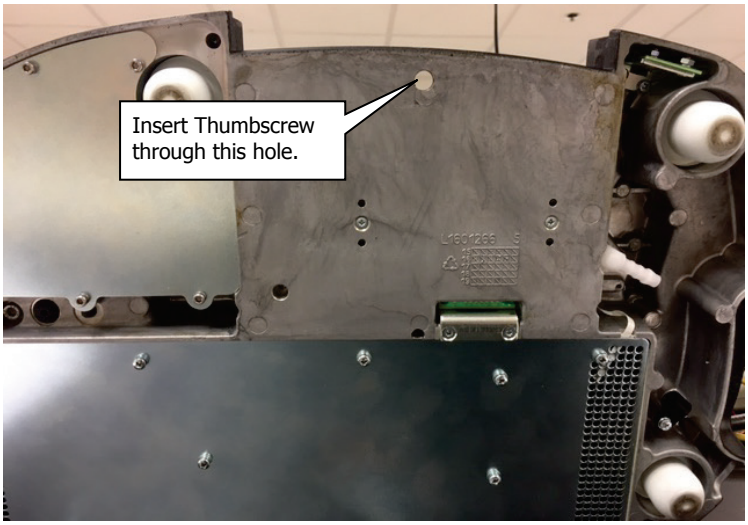


Figure 4 Thumbscrew location under the Spectrum Two N

Supplying Power to the Module

The power supply used to power the Spectrum Two N FT-NIR is also used to power the Remote Sampling Module. A power splitter cable (L1600813) is used to provide power to both the spectrometer and RSM accessory simultaneously. The power cable cord is plugged into the RSM on the bottom of the accessory. The power cable should then be routed under the first strain relief then snapped into the white strain relief and finally positioned out the back of the module. Ensure that the power supply cable is connected to the Spectrum Two N FT-NIR power supply using the accessory splitter cable and is safely routed to prevent accidental pulling.

Installing the Holster

The holster provides a convenient storage location, helps protect the probe from accidental damage, and provides a Spectralon reference material holder. The holster can be mounted on the right of your spectrometer, or to a bench.

NOTE: If a suitable mounting point for the holster cannot be found, choose a place to store the probe when it is not in use where it is unlikely to be accidentally damaged. The reference material holder can be removed from the holster and stored on the probe tip.

WARNING

Take care not to injure yourself or others, or to drop the spectrometer.

Recommend using the clamp to secure the Spectrum Two N and ensure handling of the probe does not accidentally pull the system off the table/cart.

AVERTISSEMENT

Veillez à ne pas vous blesser ou à d'autres, ou à laisser tomber le spectromètre.

Recommandez l'utilisation de la pince pour sécuriser le Spectrum Two N et assurez-vous que la manipulation de la sonde ne retire pas accidentellement le système hors table / panier.

Securing the Holster to a Bench

- Attach the holster to the bench using the provided clamp.

Figure 5 Securing the Holster to a bench

Storing the Probe in the Holster

The holster has two supports for the probe barrel, and one for its body. The removable reference material holder, which contains a Spectralon reference and a foam pad, is a keyed push fit onto the lower barrel support. When holstered, the probe tip rests on the Spectralon reference material, and is gently sprung by the foam pad.

Installing the Triggered Fiber Optic Probe

1. Insert the probe into the holster.
2. Carefully route the probe cable to the spectrometer and Sample Area Interface.

   The rugged flexible cable is an integral part of the probe. The probe cable is terminated by two optical connectors and a 9-way D-type connector used for power and control signals. These connectors fit into corresponding sockets on the front face of the interface. The cable is clamped to the interface.

CAUTION	*The probe cable length is fixed and cannot be extended without compromising instrument communication.* *To avoid damage, do not bend the probe cable through a radius of curvature of less than 100mm (4 inches).*
ATTENTION	*La longueur du câble de la sonde est fixe et ne peut pas être prolongée sans compromettre la communication de l'instrument.* *Pour éviter tout dommage, ne pas plier le câble de la sonde dans un rayon de courbure inférieur à 100mm (4 pouces).*

3. Secure the cable divide molding to the bracket on the interface using the two cap screws provided (Figure 6).

   The electrical cable to the D-type connector fits into the slot on the interface bracket.

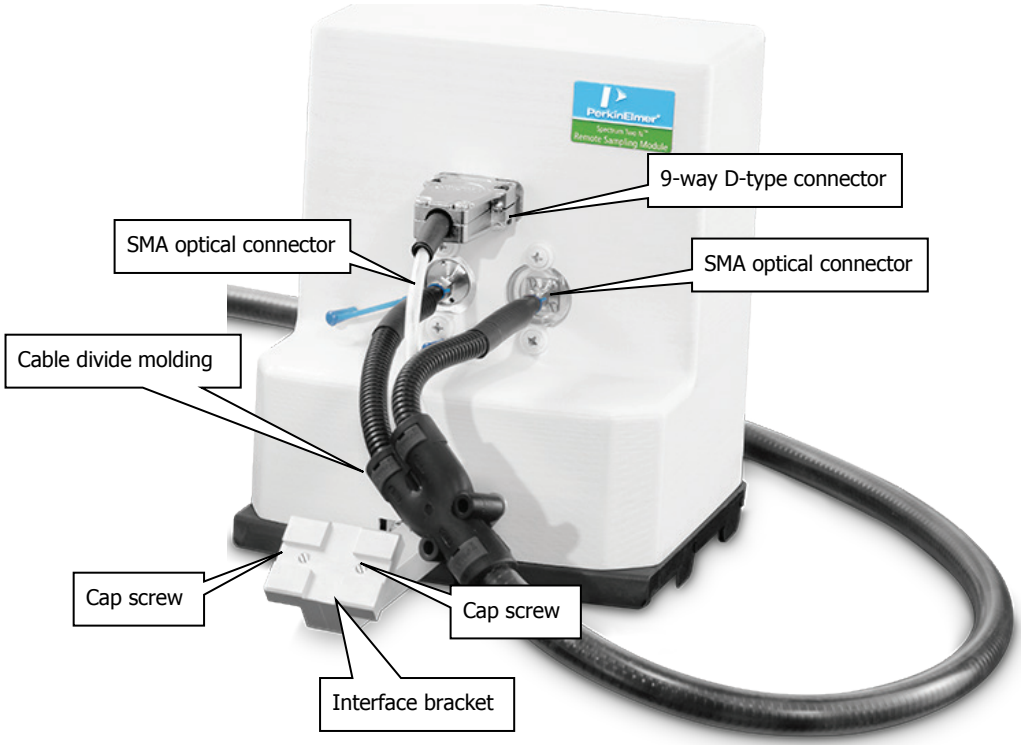


Figure 6 Connecting the probe cable to the Sample Area Interface

4. Connect the central 9–way D-type connector, then the two SMA optical connectors.

   Make sure the optical connectors are pushed fully into the interface, but do not over-tighten the clamp nuts.

CAUTION	*Optical connectors must be clean, so do not remove their protective caps until necessary.* *Take care not to touch or scratch the ends of the fiber cables when connecting them.* *If you must clean an optical connector, refer to Cleaning optical connectors on page 51.*
ATTENTION	*Les connecteurs optiques doivent être propres, donc ne pas enlever leurs capuchons de protection jusqu'à ce qu'il soit nécessaire.* *Veillez à ne pas toucher ou à gratter les extrémités des câbles de fibres lors de leur connexion.* *Si vous devez nettoyer un connecteur optique, reportez-vous à la section Nettoyage des connecteurs optiques à la page 51.*

Your Remote Sampling Module is now physically installed. If you have Spectrum 10 version 10.6 software, your installation is complete. If you have AssureID version 4.0 or later, complete the installation using the Install Accessory Wizard in your software application.

The Install Accessory Wizard (Assure ID)

NOTE: There is no accessory installation wizard in Spectrum version 10.6 (or later). If you have added your instrument to the software, when you install the accessory in the spectrometer it will be recognized by the software.

The accessory installation wizard is common to the Assure ID version 4 (or later). The wizard tests the accessory against, for example, any shipping damage.

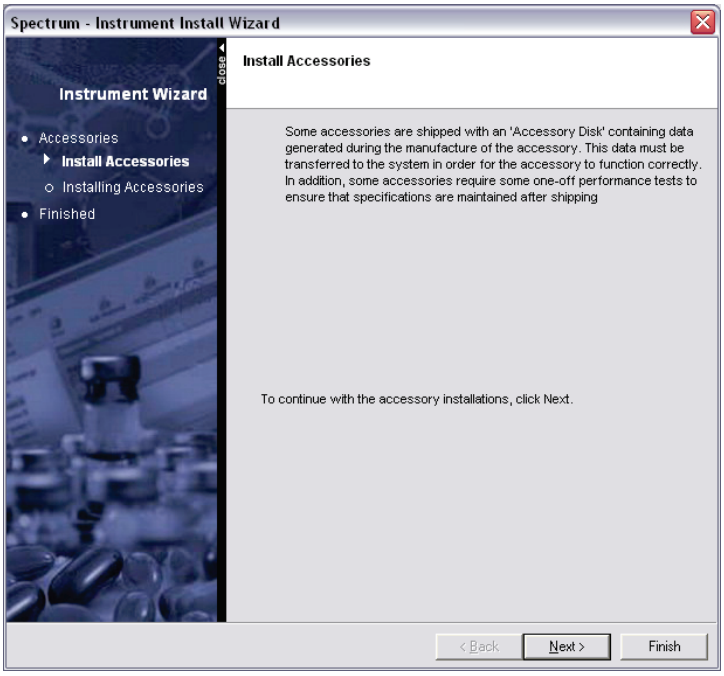
NOTE: Before you install the Remote Sampling Module you must add and configure an instrument.

1. Login to AssureID Method Explorer.

   In the Enhanced Security (ES) version of AssureID you need to login as a Developer; in the Standard version of AssureID you need to login as an Analyst.

2. In AssureID, select Tools, then Configure Instruments and Accessories, and then Configure Accessories.

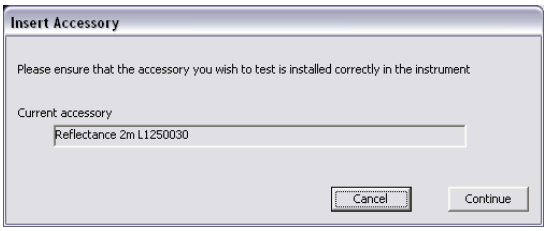
   The Instrument Install Wizard starts.



3. Click **Next**.

   The **Insert Accessory** dialog is displayed.

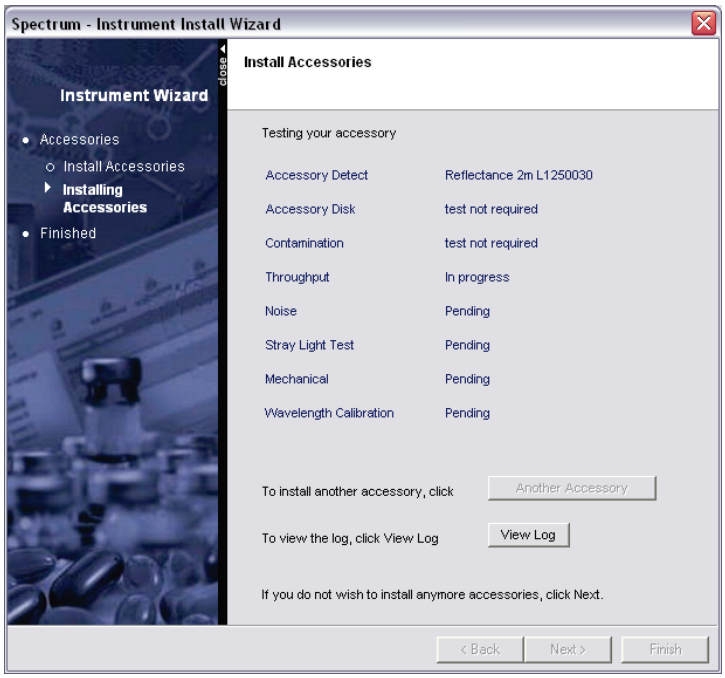
   If you have not already done so, fit the Remote Sampling Module as described above.



   The probe type and part number of the Remote Sampling Module are recognized by the wizard.

4. Click **Continue.**

   The accessory tests are performed.

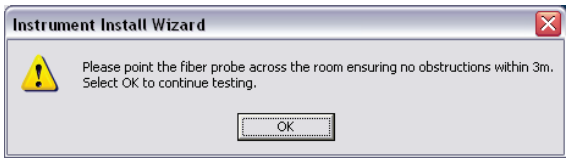


Before beginning the Throughput test, you are prompted to holster the probe.

5. Holster the probe, making sure that the Spectralon reference material is in place, and then click **OK**.

   The Throughput and Noise tests are performed.

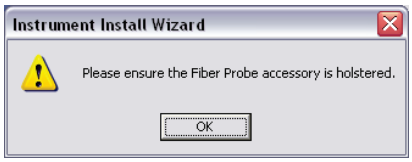
   Before beginning the Stray Light Test, you are prompted to unholster the probe and point it across the room.



6. Unholster the probe, point it across the room (not at another person), then click **OK**.

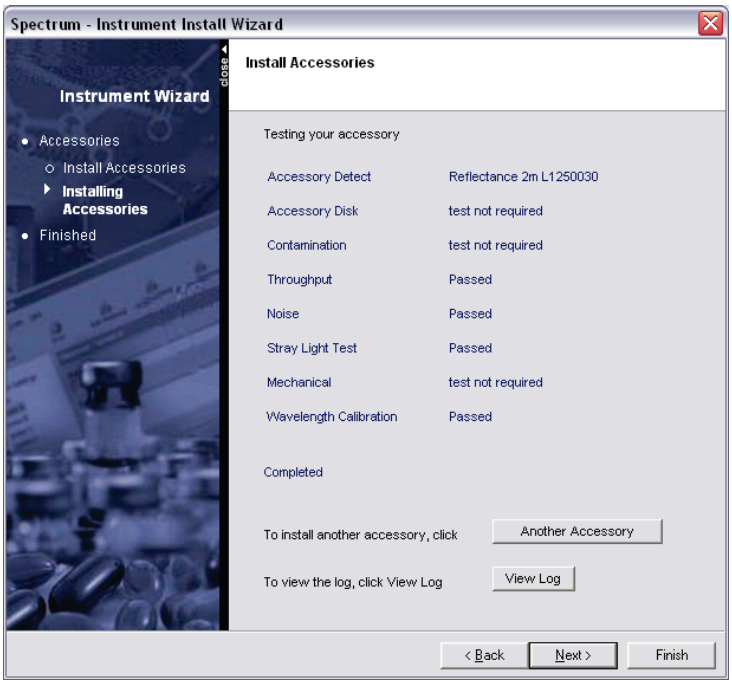
   The Stray Light Test is performed.

   Before beginning Wavenumber Calibration, you are prompted to holster the probe.



7. Holster the probe, making sure that the Spectralon reference material is in place, and then click **OK**.

   When the accessory tests and calibration have finished, the wizard displays Completed.



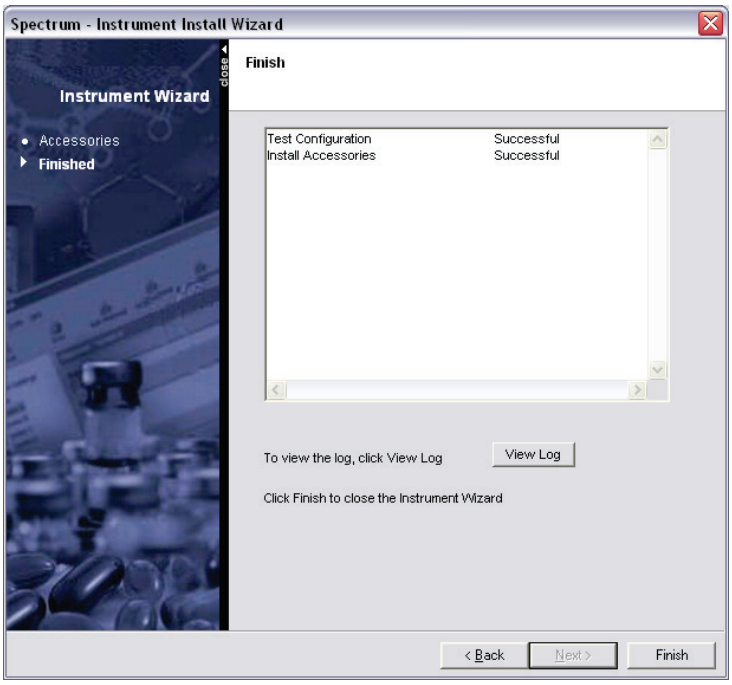
8. Click **View Log.**

   A new window allows you to see the results in more detail.

   If you want to view the results of the accessories tests later, the log is stored at C:\Program Files86\PerkinElmer\ServiceIR\<Instrument Serial Number>\PerformanceTests xxx\PerformanceTests.Log (where xxx is an incremented number).

9. Click **Next**.

   The **Finish** page is displayed.



10. Click **Finish** to close the Instrument Install Wizard.

    The accessory is now ready for use.

Using the Remote Sampling Module

System Description

The major components of the accessory are the Sample Area Interface (fitted in the spectrometer sample area), the Triggered Fiber Optic Probe, and a holster for the probe that is mounted on the spectrometer or bench.

The Remote Sampling Module is used in conjunction with the AssureID and/or Spectrum software applications. Remote data collection utilizes the multiple sample table functionality introduced with AssureID version 4.0 and Spectrum 10 version 10.6 or later.

Figure 7 Remote Sampling Module fitted to a Spectrum Two N FT-IR System

The Sample Area Interface

The Sample Area Interface directs near-infrared (NIR) light from the spectrometer to the probe tip. At the probe tip, reflected light is collected from the sample and then returned to the detector in the interface.

The Sample Area Interface also provides electrical power and control signals to the probe. These are used to drive the display, the status indicator and other controls, which allow spectra to be gathered remotely from the spectrometer.

The Sample Area Interface fits in the spectrometer sample area. The interface baseplate latches into the sample area. An additional thumbscrew locks the interface into place (Figure 8).

The interface connection to the spectrometer allows the accessory to be identified by the software.

Figure 8 Sample Area Interface fitted in sample area

The Triggered Fiber Optic Probe

The Fiber Optic Probe includes all the controls needed for spectra to be collected remotely from the spectrometer:

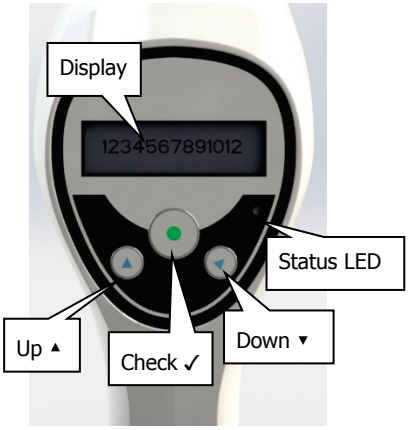


Figure 9 Triggered Fiber Optic Probe

Controls & Indicators	Typical Use
Display	Displays prompts from your software application similar to those provided by the PC.
Trigger	Starts data collection.
✓(Check)	Selects a sample or option; Halt data collection.
▲(Up)	Navigates to a sample which has been previously set up in the multiple sample table in the software.
▼(Down)	
Tri-color status indicator	Indicates status or progress: amber (collecting data), green (pass), red (fail).

The Probe Holster

When not in use or during setup, the Fiber Optic Probe is stored in a holster that can be mounted either on the right of the spectrometer, or mounted on a bench. This holster includes a probe tip cover containing a Spectralon reference, which is used to validate the correct operation of the accessory.

Figure 10 Triggered Fiber Optic Probe in the Holster

Using the Triggered Probe with Spectrum 10 (version 10.6 or later)

When the Triggered Probe is installed in the spectrometer, the software detects the presence of the accessory, and the Triggered Fiber Optic Probe icon  is added to the toolbar.

The **Setup Instrument Basic** (Figure 11) and **Setup Instrument BeamPath** (Figure 12) tabs are updated to show that the accessory is in position.

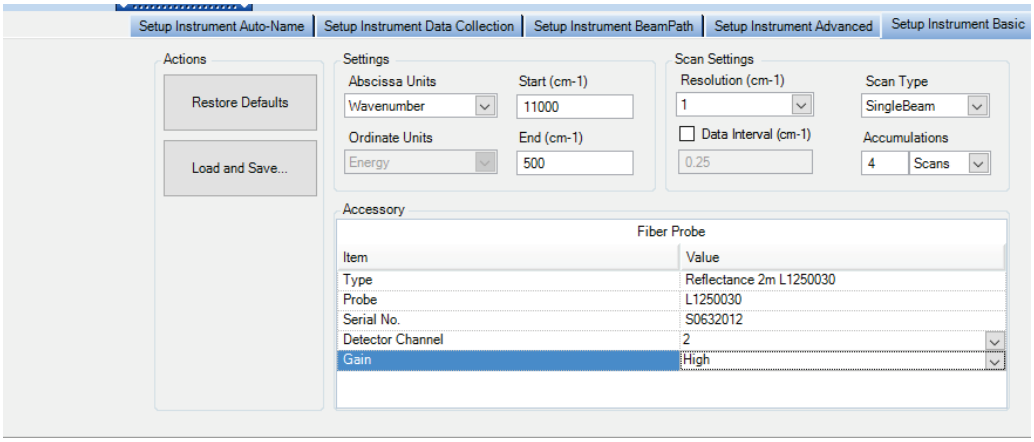


Figure 11 Setup Instrument Basic tab with Remote Sampling Module Controls

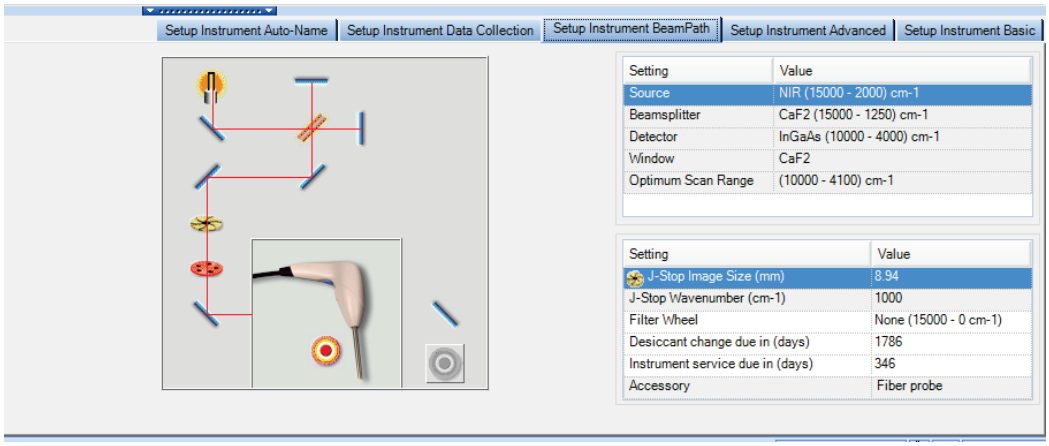


Figure 12 Setup Instrument BeamPath tab with Remote Sampling Module icon

Performing a Scan

1. Enter the required scan and instrument parameters in the Instrument Settings toolbar.

   For most applications, a spectral resolution of 16 cm^{-1} and about 30 accumulations are sufficient to generate high quality spectra.

   When your accessory is installed in the instrument, Spectrum will default to the instrument settings last used to perform a successful scan with that accessory.

2. Select the appropriate **Gain** setting.

   The options are **High** or **Low**. High is the default setting. The Low setting corresponds to a lower energy setting suitable for transmission probes.

3. Select **Sample Table** from the Measurement menu.

   OR

   Open the Data Explorer pane, and then select **Sample Table**.

4. Enter the number of samples and then complete the **SampleID** and **Description** for each sample.

   See the on-screen help for more information about adding samples to the Sample Table.

NOTE: When you have entered the sample details you can, if you wish, collect data remotely from the PC using the displayed prompts and the buttons on the probe control panel.

For example, you can press ▲or ▼to display another SampleID before you press ✓to select it.

5. If a new background scan is required, you are reminded to make sure that the probe tip is in contact with the Spectralon reference.

   Spectrum automatically alerts you when you need a new background, and can be configured to request a new background at set intervals (on the Setup Instrument Data Collection tab).

6. Holster the probe and then press the probe trigger, or click **Background**.

   The probe display shows 'Scanning Background, Press ✓to Halt'.

   You are then prompted to collect spectra for your samples. The probe display shows 'Insert <*SampleID*>, Press 〉 to Start'. You can press ▲or ▼to display another SampleID before you press ✓to select it.

7. Rest the tip of the probe on your sample and then press the probe trigger, or click **Scan**.

   Maintain the probe tip at a constant position and pressure until scanning is complete.

   The probe display shows 'Scanning <*SampleID*>, Press ✓to Halt'.

NOTE: It may not be necessary for the probe tip to come into direct contact with your sample. It is sometimes possible to collect suitable NIR reflectance spectra through a vial or sample bag.

8. If you want to stop data collection for any reason press ✓on the probe control panel, or click **Halt**.

   When scanning is complete the spectrum is added to the Samples View. A green tick in the Sample Table indicates that a sample has been run.

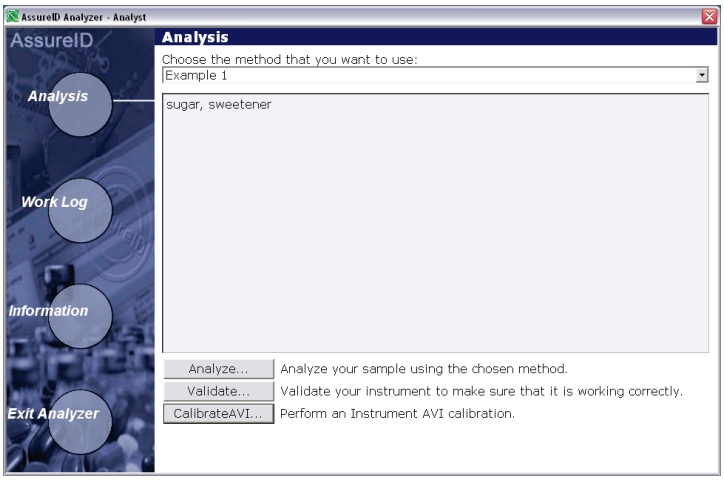
If you want to set additional instrument parameters that are not displayed in the Scan toolbars, use the Setup Instrument tabs in the Dialog Pane at the bottom of the workspace.

The Spectrum on-screen Help describes how to format, process and report your results. To view the Help, select **Contents** from the Help menu.

Using the Triggered Probe in an AssureID Method

In this section we will describe how to use the Remote Sampling Module with AssureID Analyzer (following a method pre-defined by an AssureID Developer using Method Editor) to distinguish between two white granular solids, namely white sugar and sweetener. The structure of this example is a useful template for method creation.

1. Login to AssureID Analyzer as an Analyst.



NOTE: The **Validate** and **CalibrateAVI** buttons may not be present. They are permissions dependent.

2. Select the pre-defined method you will use to analyze your samples, and then click **Analyze**.
3. Follow the analysis workflow.

   You may be prompted to **Validate** the instrument before you can analyze your samples. The method is associated with a validation workflow that is appropriate for the accessory. If validation is not needed, see *Analysis* on page 39.

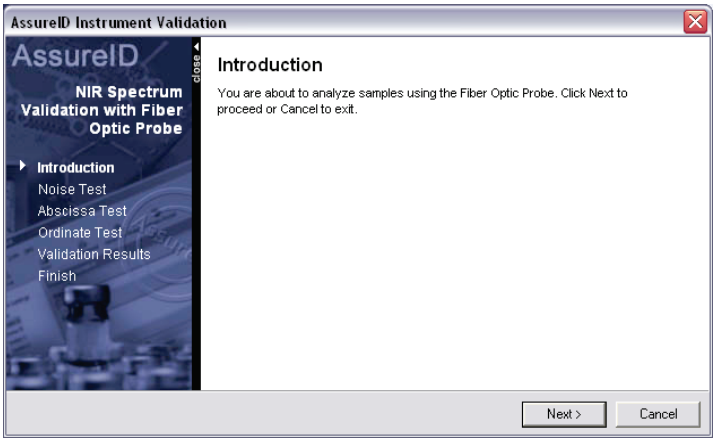
   AssureID Analyzer also allows you to perform AVI calibration (**CalibrateAVI**), before you begin to **Analyze** your samples. See *AVI Calibration and Correction* on page 38.

Validation

The objective of Instrument Validation is to ensure that your system is working correctly.

1. Click **Validate**.

   The Introduction page lists the tests to be performed.

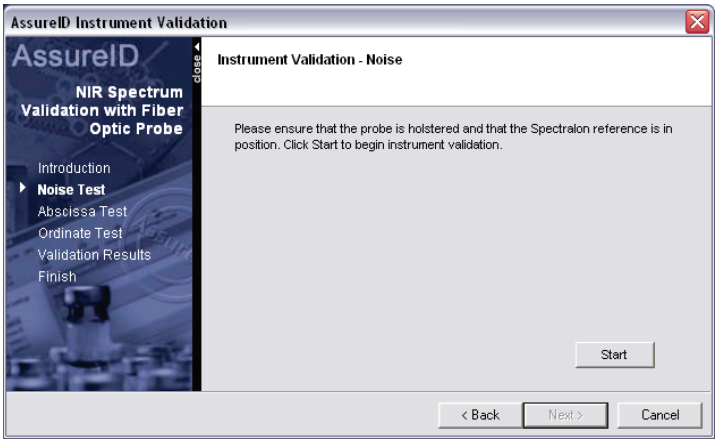


The probe display shows 'Instrument Validation Starting'.

NOTE: All the Validation Tests that can be specified for the Remote Sampling Module are documented in the AssureID Method Editor Help system.

2. Click **Next**.

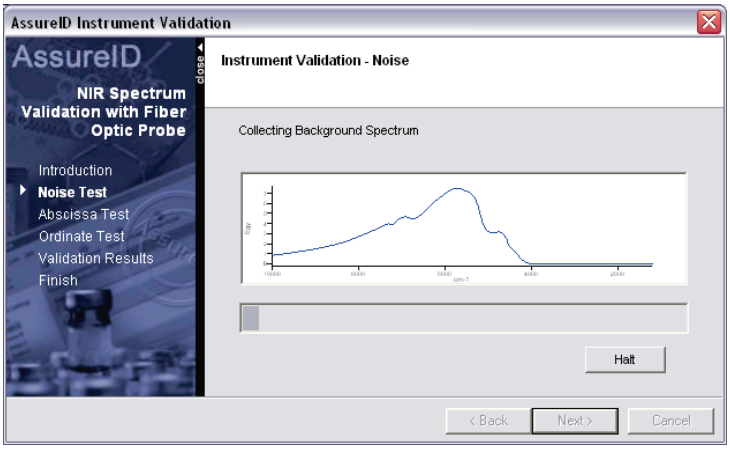
   You are reminded to make sure that the probe tip is in contact with the Spectralon reference.



   The probe display shows 'Holster Probe'.

3. Holster the probe, making sure that the Spectralon reference material is in place, and then press the probe trigger or click **Start**.

   The Noise Test begins by collecting a background spectrum.



   The probe display shows 'Collecting Background'.

4. If for any reason you want to stop data collection, press ✓on the probe control panel, or click **Halt**.

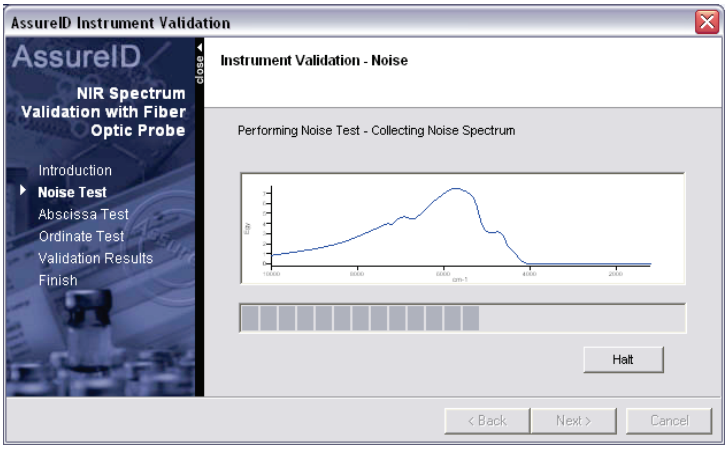
   The wizard stops, displays a **Repeat** button, and activates the **Back** button.

5. Press the probe trigger, or click **Repeat**, to redo the test.

   OR

   Click **Back** to revisit a page or test result.

   When the background spectrum is available, the noise spectrum is collected.

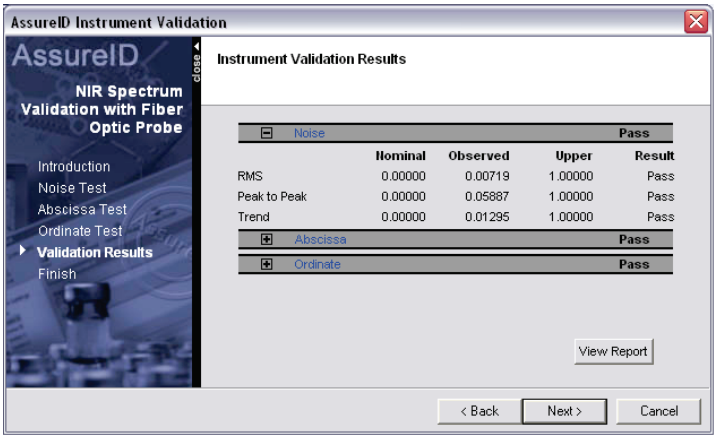


   The probe display shows 'Collecting Noise Spectrum'.

   When a test is completed, its results are displayed.

   - If the test is passed, the wizard automatically continues with the next test, collecting data and then displaying its results.
   - If the test is failed, the wizard stops to allow you examine the results. Press the probe trigger, or click **Next** to continue.

   When all the tests are completed, the Validation Results page is displayed.



6. To view the test results in detail, click **+** (to expand), or **–** (to contract), the Validation Results for an individual test,

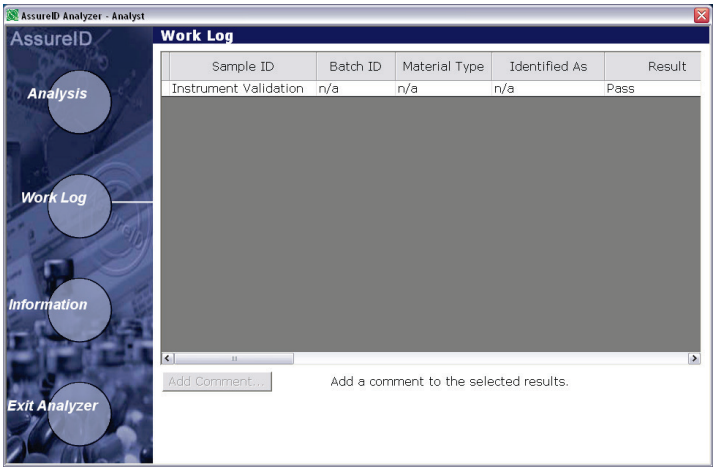
   OR

   Click **View Report** to display the results in a printable format.

7. Click **Next** to display the final page of the wizard.

8. Click **Finish**.

The Work Log for the session is displayed.



9. Click **Analysis** to return to the Analysis page.

AVI Calibration and Correction

The objectives of Absolute Virtual Instrument (AVI) correction are consistent performance over time and between instruments, and traceability for all measurements.

AVI calibration must be performed before AVI correction can be used. The AVI calibration routine collects a spectrum from an absolute standard (the methane cell in the spectrometer filterwheel) and then calculates the correction needed for the collected spectrum to match this known standard.

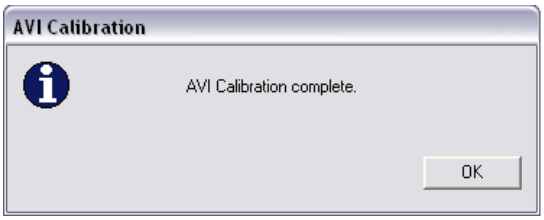
1. Click **CalibrateAVI**.

   You are prompted to clear the beampath in order to collect a background spectrum.

2. Holster the probe, making sure that the Spectralon reference material is in place, and then click **Continue**.

   For reflectance measurements, such as those performed using the Remote Sampling Module, AVI calibration is against a 'white' reference, such as the Spectralon reference supplied with the accessory.

   The window updates as the routine collects the background spectrum, collects a methane spectrum and then completes the AVI calibration.



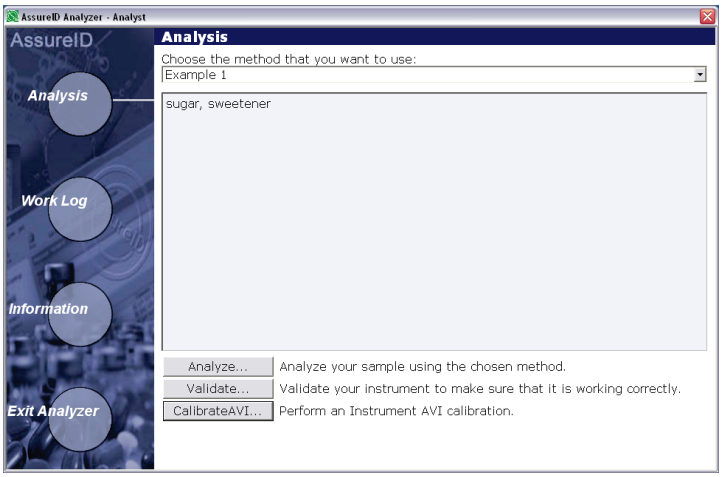
3. Click **OK**.

   The AVI calibration routine closes.

You now have an AVI calibration for the Fiber Optic Probe under the Instrument Settings specified for the method in Method Editor (or the Reference Data Instrument Settings in Method Explorer). Another method that uses different instrument settings may require an alternative AVI.

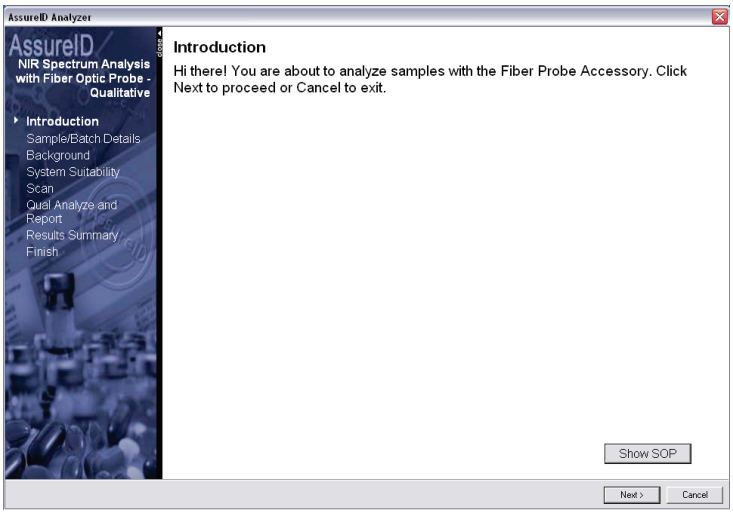
Analysis

1. Select the method to be used, in this case Example 1, and then click **Analyze**.



   An introductory screen is displayed.

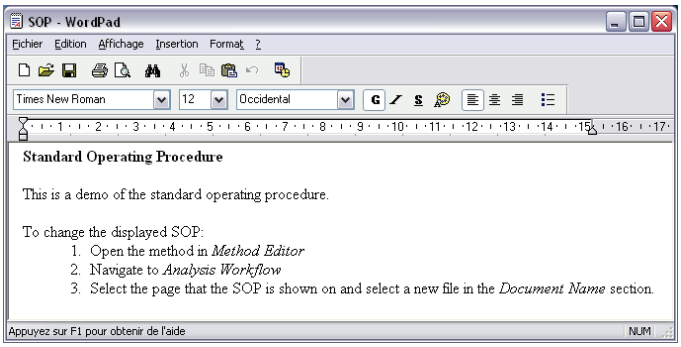
   The Introduction can provide useful information and instructions.



   The probe display shows 'Analysis Starting'.

   Notice that this screen can include a **Show SOP** button.

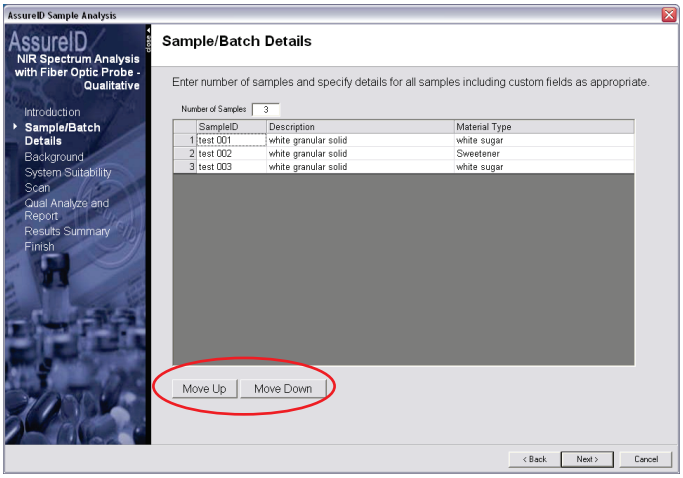
2. If present, click **Show SOP** to open your 'Standard Operating Procedure' for the method.



Typically, the SOP is a .pdf file that opens in Adobe Reader.

3. Click **Next**.

   A multiple sample table is presented.



4. For a qualitative method, as described here, enter the **Number of Samples** and then complete the **SampleID**, **Description** and **Material Type** for each sample.

   The probe display shows the <*SampleID*> for the first sample followed by 'Press ✓to Select'.

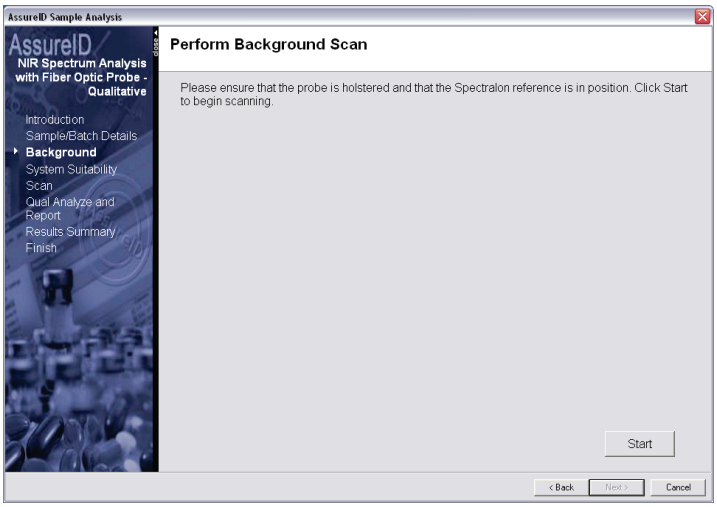
NOTE: You can edit the table as you work. For example, you can select a sample and then use the **Move Up** and **Move Down** buttons to change its position in the table.

5. To select the sample, press ✓on the probe, or click **Next**.

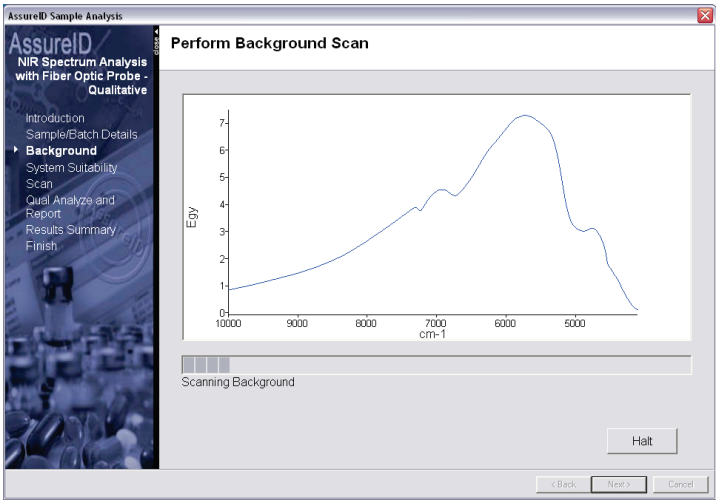
NOTE: When you have entered the sample details you can, if you wish, collect data remotely from the PC using the displayed prompts and the buttons on the probe control panel.

For example, you can press ▲or ▼to display another SampleID before you press ✓to select it.

If a new background scan is required, you are reminded to make sure that the probe tip is in contact with the Spectralon reference.



6. Holster the probe and then press the probe trigger, or click **Start**, to begin data collection.



The probe display shows 'Scanning Background, Press ✓to Halt'.

The System Suitability checks specified in the method are now performed.

These checks (which can cover Contamination, Throughput, Noise, Abscissa and Control checks) ensure that the complete measurement system is fit-for-purpose.

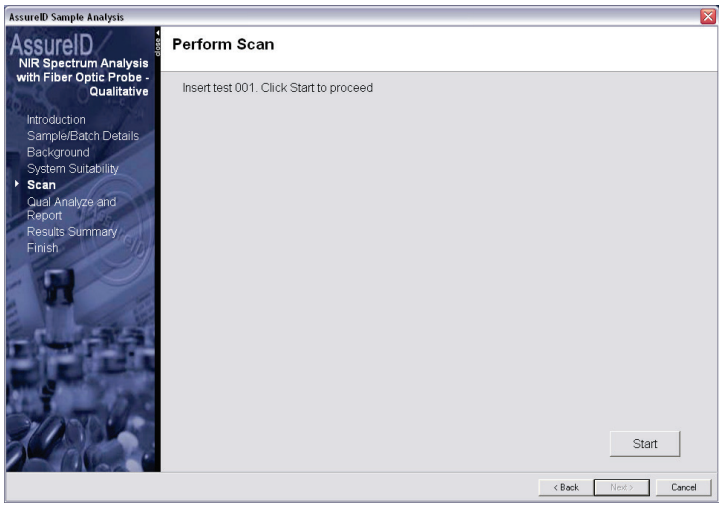
You cannot complete your analysis unless these tests are passed.

The probe display shows 'All Checks Passed, Press ✓to Analyze'.

NOTE: All the System Suitability checks that can be specified are documented in the AssureID Help.

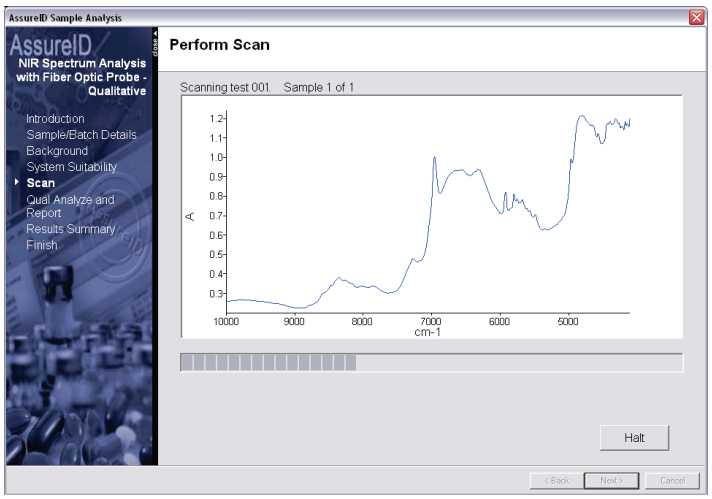
7. To begin scanning press ✓on the probe control panel, or click **Next**.

   You are now prompted to collect spectra for your samples.



The probe display shows 'Insert <*SampleID*>, Press 〉 to Start'.

8. Rest the tip of the probe on your sample and then press the probe trigger, or click **Start**.
   Maintain the probe tip at a constant position and pressure until scanning is complete.



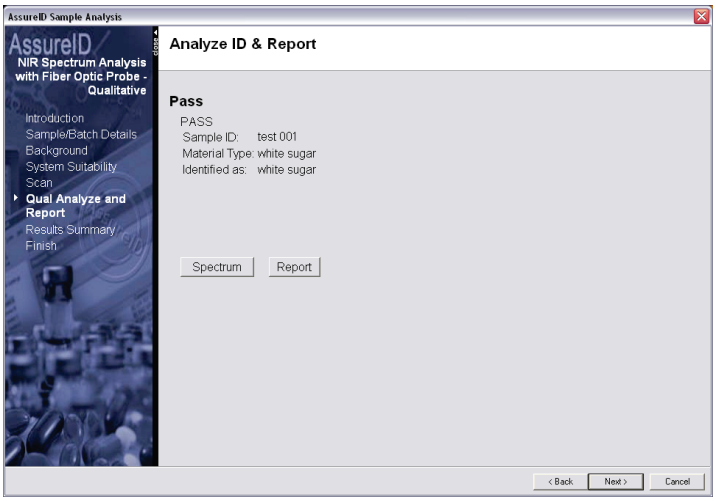
The probe display shows 'Scanning <*SampleID*>, Press ✓to Halt'.

NOTE:	It may not be necessary for the probe tip to come into direct contact with your sample. It is sometimes possible to collect suitable NIR reflectance spectra through a vial or sample bag.

9. If you want to stop data collection for any reason press ✓on the probe control panel, or click **Halt**.

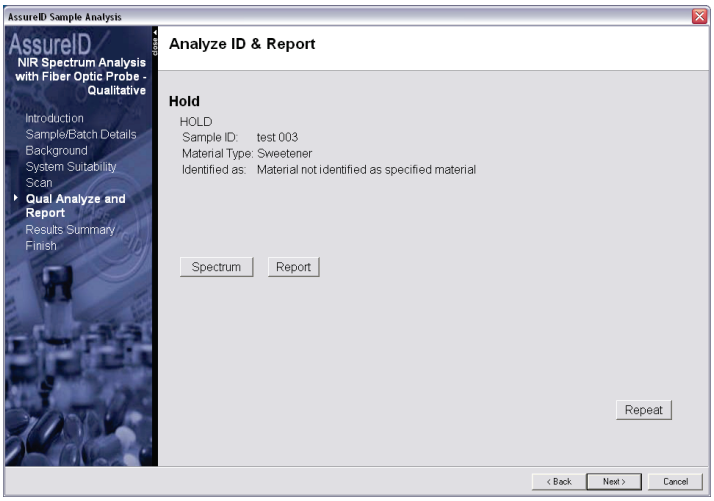
   When scanning is complete the result is shown on the PC and on the probe display.

   If the sample spectrum matched the spectra referenced by the method for the material specified, the following message is displayed:



The probe display shows 'PASS <*Identified As*>, Press ✓for Next'.

If the sample spectrum does not match the spectra referenced for the material specified, so the result was placed on Hold:



The probe display shows 'Hold Not Identified, Press 〉 to Repeat'.

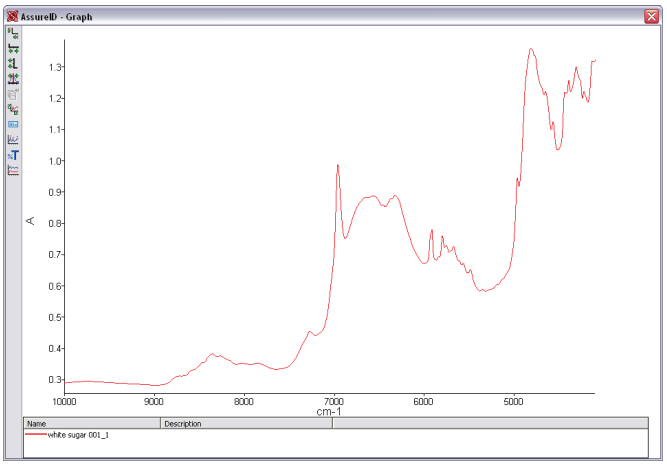
To collect another spectrum from the sample, press the probe trigger, or click **Repeat**.

After three attempts (by default - this number is defined in the workflow), the result is confimed as failed.

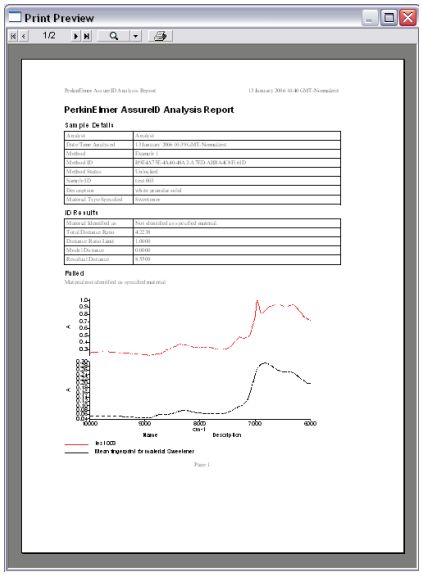
The probe display shows 'Not Identified, Press ✓for Next'.

NOTE: If you do not want to repeat data collection, press ▲or ▼on the probe control panel to display another <*SampleID*>, and then press ✓to select it.

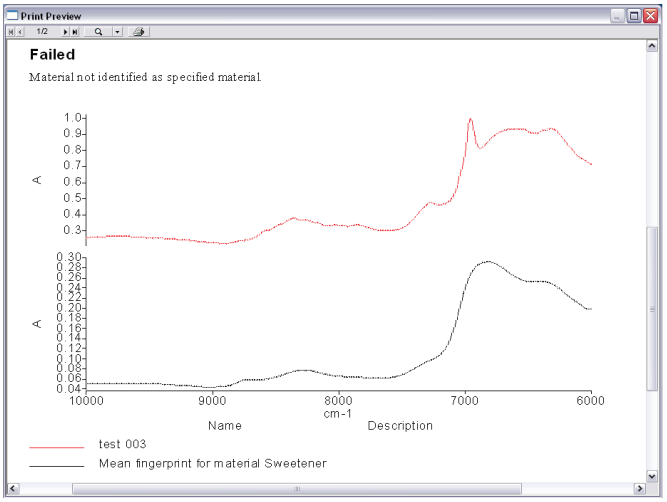
10. To view the spectrum collected for the sample, click **Spectrum** on the Analyze ID & Report page in the analysis workflow.



11. To view the report compiled for the sample, click **Report**.



The report shows the results of the analysis. In this example, the spectrum collected for test 003 is not the material specified.



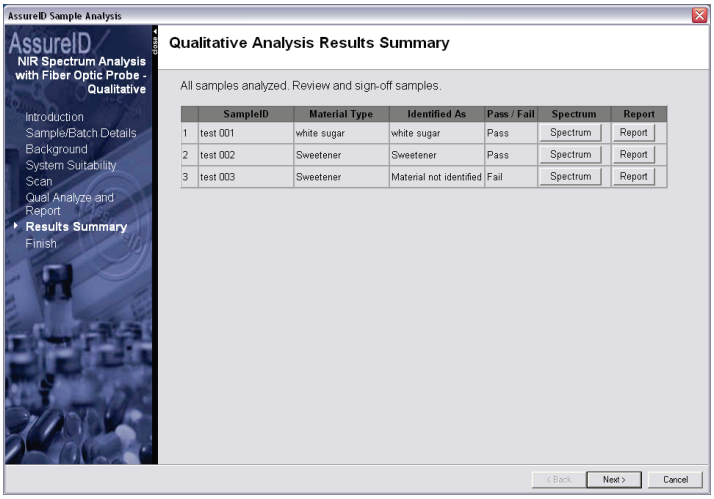
12. To scan your next sample, close any open report windows and then press ✓on the probe control panel, or click **Next**.

> **NOTE:** You can press ▲or ▼on the probe control panel to display another <*SampleID*> before you press ✓to select it.

You are prompted to collect data for the next sample.

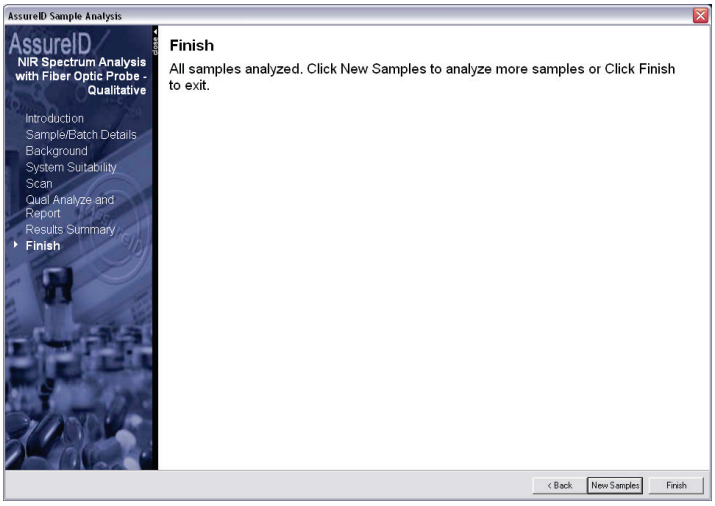
13. Click the probe trigger, or click **Next**.

When you have collected data for all your samples, a Results Summary is displayed.
The buttons within this table allow you to view the **Spectrum** and **Report** for all the samples analyzed.



The probe display shows 'All Samples Analyzed'.

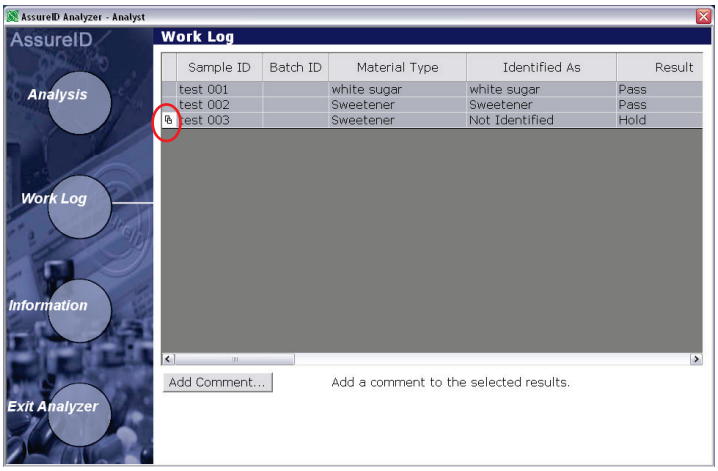
14. Click **Next**.



If you have more samples you want to analyze using the same method, click **New Samples** to return to the Sample/Batch details table.

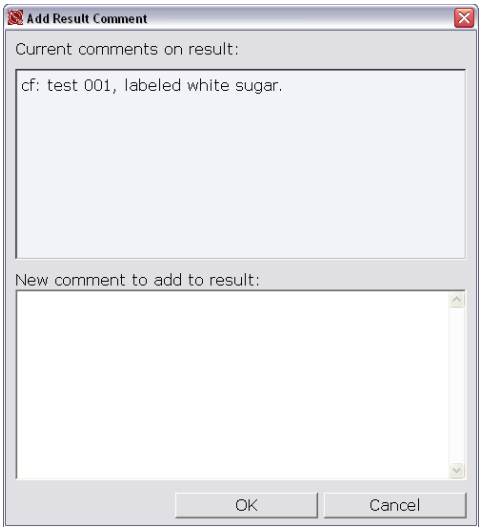
15. Click **Finish.**

In the Enhanced Security (ES) version of AssureID you are prompted to sign off your results in the Work Log.



The probe display shows 'NIR Fiber Optic Probe'.

16. To annotate a sample result, select it, click **Add Comment,** enter your text and then click **OK**.



The  icon appended to test 003 indicates that a comment has been added.

17. When you have completed your work click **Exit Analyzer**.

Further Information

Tutorials about using the procedures and methods most appropriate for using this accessory with AssureID version 4 are provided with the software application.

For detailed information about your spectrometer, and for maintenance and troubleshooting procedures, see the user documentation supplied with your spectrometer.

Help

On-screen Help is provided with the AssureID and Spectrum software applications.

In addition, a version of the help file in an easier format for viewing away from the PC is available. Click on the User's Guide button on the toolbar in the Help window. Adobe Reader must be installed for you to view or print these .pdf documents.

Maintenance

Cleaning Procedures

NOTE: We recommend the use of non-abrasive, pH-neutral, phosphate-free detergents. Some detergents, particularly those designed for use in washing machines, are alkaline and may etch non-ferrous metals and some plastics. The product chosen must be totally rinse-able.

Decontaminating the Probe Tip

- Wipe the barrel and tip using, for example, the recommended concentration of a standard laboratory detergent, rinse using de-ionized water and then air dry.

Decontaminating the Spectralon Reference Material

1. Remove the probe from its holster, then pull the reference material holder off the holster (or, if the holster is not used, pull it off the tip of the probe).
2. Tap the top of the holder on a clean surface to release the reference material. If necessary, push a thin wire (such as a bent paperclip) into the hole in the base of the holder to release both the reference material and the foam pad.

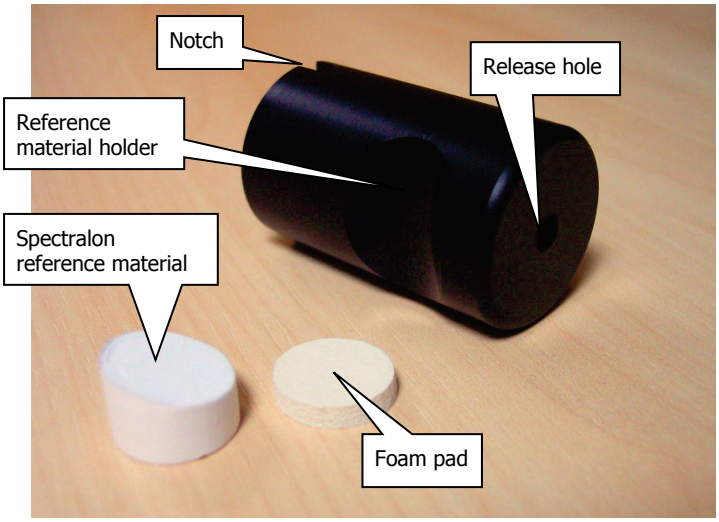


Figure 13 Reference material holder

Although the reference material is very durable, it is an optical standard that should be treated with care. Avoid contaminating the sloped surface that makes contact with the probe with finger oils.

3. If lightly soiled, brush this surface using a jet of clean dry air or nitrogen.

   OR

   If necessary, use 220–240 grit waterproof emery cloth or silicon carbide paper to sand the surface on a flat plate under running water. Rinse using de-ionized water, then air dry.

4. Rinse the holder and pad using the recommended concentration of a standard laboratory detergent, rinse using de-ionized water, and then air dry.
5. Place the foam pad in the bottom of the holder, followed by the reference material.

   The flat base of the reference material rests on the foam pad. The probe will rest on the angled face of the reference material.

Looking into the holder with the notch (Figure 21) to your left, the thick edge of the reference material should be at the bottom. This alignment need not be precise as the reference sample aligns itself in use.

6. Push the sample holder onto the holster.
   The notch fits into an alignment key close to the spectrometer.
7. Carefully place the probe in the holster, or the holder on the probe tip, and then gently push the probe against the resistance of the foam pad to complete the alignment.

Cleaning the Probe Body and Cable

CAUTION	*Do not use copious amounts of water or allow the water to enter the probe casing.*
ATTENTION	*Ne pas utiliser de grandes quantités d'eau ou permettre à l'eau d'entrer dans le carter de la sonde.*

Wipe all external surfaces with a lint-free cloth. If necessary, this cloth may be dampened with a mild detergent solution. Wipe the tip using isopropyl alcohol (IPA).

Cleaning Optical Connectors

CAUTION	*Do not remove the protective cap fitted to an optical connector until necessary and, when disconnected, always protect the connector with a clean protective cap.* *If treated with care, an optical connector may never require cleaning.* *If the connector becomes dirty, bear in mind that it may already be scratched and its performance degraded.*
ATTENTION	*Ne retirez pas le capuchon de protection installé sur un connecteur optique jusqu'à ce qu'il soit nécessaire et, lorsqu'il est débranché, protégez toujours le connecteur avec un capuchon de protection propre.* *Si traité avec précaution, un connecteur optique peut ne jamais nécessiter de nettoyage.* *Si le connecteur devient sale, gardez à l'esprit qu'il pourrait déjà être rayé et ses performances dégradées.*

These cleaning methods should minimize any further damage to the connector:

If the connector is dusty:

- Using a gentle circular motion, wipe the connector surface with a new lint-free swab or lens tissue, and then blow away any remaining dust using a jet of clean dry air.

If the contamination is greasy:

1. Using a gentle circular motion, wipe the connector surface with a new lint-free swab or lens tissue dampened with isopropyl alcohol (IPA).
2. In the same manner, remove the alcohol with a new dry swab or tissue, and then blow away any remaining dust using a can of compressed air.

NOTE: To avoid residues, do not allow the alcohol to dry on the connector.

Spare Parts

New reference material and pads can be purchased using the following part numbers:

Part Number	Description
L1241446	Spectralon reference material
L1241445	Foam pad

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